

Formaldehyde Rules

Chapter 296-856 WAC

Resources

Helpful Tools

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Notes

Substance Technical Guideline for Formaldehyde

Use with the Formaldehyde Rule, Chapter 296-856 WAC

This helpful tool is a guideline for both:

- General information about formaldehyde exposure
and
- Specific information about Formaldehyde solution called Formalin.
 - Formaldehyde is most commonly used as formalin, which is a solution that contains 37% formaldehyde in water.

When exposure is from resins capable of releasing formaldehyde, the resin itself and other impurities or decomposition products may also be toxic. You should be aware of the hazards associated with all materials you handle.

Specific information and guidance about formaldehyde are outlined in this helpful tool under the following topics:

- Formaldehyde Health Effects
- Formaldehyde Technical Data Sheet
- Exposure monitoring
- Exposure controls
- Personal Protective Equipment (PPE)
- Spills and Other Emergencies
- Emergency First Aid Response



Substance Technical Guideline for Formaldehyde

Use with the Formaldehyde Rule, Chapter 296-856 WAC

FORMALDEHYDE HEALTH EFFECTS

Both *acute* and *chronic* exposures to formaldehyde can cause adverse health effects.

Acute Exposures

- Acute exposures generally consist of single exposures to high concentrations of formaldehyde, which may occur during an uncontrolled spill or release of formaldehyde gas.
- Acute formaldehyde exposure effects are shown in Table HT-1, *Acute Health Effects of Formaldehyde Exposure*.



Substance Technical Guideline for Formaldehyde

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FORMALDEHYDE HEALTH EFFECTS (CONTINUED)

Table HT-1
Acute Health Effects of Formaldehyde Exposure

Type of contact	Health Effects
Ingestion (swallowing)	Liquids containing 10% to 40% formaldehyde cause severe irritation and inflammation of the mouth, throat, and stomach. Severe stomach pains will follow ingestion with possible loss of consciousness and death.
	Ingestion of dilute formaldehyde solutions (0.03% to 0.04%) may cause discomfort in the stomach and pharynx.
Inhalation (breathing)	Formaldehyde is highly irritating to the upper respiratory tract and eyes.
	0.5 to 2.0 parts per million (ppm) may irritate the eyes, nose, and throat of some individuals.
	3 to 5 ppm also cause tearing of the eyes and are intolerable to some persons.
	10 to 20 ppm cause difficulty in breathing, burning of the nose and throat, coughing, and heavy tearing of the eyes
	25 to 30 ppm causes severe respiratory tract injury leading to inflammation and accumulation of fluid in the lung
	100 ppm is immediately dangerous to life and health. Deaths from accidental exposure to high concentrations of formaldehyde have been reported.
Skin	Formaldehyde is a severe skin irritant and a sensitizer.
	Contact with Formaldehyde causes white discoloration, smarting, drying, cracking, and scaling.
	Prolonged and repeated contact can cause numbness and a hardening or tanning of the skin.
	Previously exposed persons may react to future exposure with an allergic eczematous dermatitis or hives.
Eye	Formaldehyde solutions splashed in the eye can cause injuries ranging from transient discomfort to severe, permanent corneal clouding and loss of vision.
	The severity of the effect depends on the concentration of formaldehyde in the solution and if the eyes are flushed with water immediately after the incident. Note: The perception of formaldehyde by odor and eye irritation becomes less apparent over time, as one gets used to formaldehyde exposure. This can lead to a hazardous exposure if a worker is relying on odor or irritation to alert them to the potential for exposure.



Substance Technical Guideline for Formaldehyde

Use with the Formaldehyde Rule, Chapter 296-856 WAC

FORMALDEHYDE HEALTH EFFECTS (CONTINUED)

Chronic exposures

- Chronic exposures are the result of exposure to low levels of formaldehyde over a period of time. Because of the low level exposure, the employee may not be aware of any immediate symptoms of exposure.
- The effects of chronic formaldehyde exposure can include the following:
 - Cancer
 - In humans, formaldehyde exposure has been associated with cancers of the lung, nasopharynx and oropharynx, and nasal passages. Repeated and prolonged exposure increases the risk.
 - Various animal experiments have conclusively shown formaldehyde causes cancer in rats.
 - Damage to DNA
 - DNA breaks
 - Sister chromatid exchange (DNA transfer during cell division)
 - Other chromosomal abnormalities.
 - Respiratory impairment
 - Some persons have developed asthma or bronchitis following exposure to formaldehyde, most often as the result of an accidental spill involving a single exposure to a high concentration of formaldehyde.
 - Structural changes in the epithelial cells in the human nose have been observed.
 - Rats exposed to formaldehyde at 2 ppm developed benign nasal tumors and changes of the cell structure in the nose as well as inflamed mucous membranes of the nose.



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FORMALDEHYDE TECHNICAL DATA SHEET

- General and specific information about Formaldehyde is outlined in the Formaldehyde Technical Data Sheet. This information can be used to inform and train your employees about the safe handling practices and hazards of formaldehyde in your workplace.
- Specific training requirements are found in Training, WAC 296-856-20020, in this chapter.
 - You should modify your training according to the actual products used.
 - Product specific information can be obtained from the material safety data sheet you receive with the product, or from the manufacturer or supplier.



Note:

- The precise hazards from exposure to formaldehyde depend on both of the following:
 - The form (solid, liquid, or gas) of the material
 - The concentration of formaldehyde present
- For example, spills or splashes from 37% to 50% solutions of formaldehyde present a much greater hazard to the skin and eyes than from solutions containing less than 1% formaldehyde.



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FORMALDEHYDE TECHNICAL DATA SHEET

Formaldehyde Synonyms

- Formaldehyde
- Formic Aldehyde
- Paraform
- Formol
- Formaldehyde (Methanol-free)
- Fyde
- Formalith
- Methanal
- Methyl Aldehyde
- Methylene Glycol
- Methylene Oxide
- Tetraoxymethalene
- Oxomethane
- Oxymethylene

Chemical information

- Family: Aldehyde
- Formula: CH_2O
- Molecular weight: 30.03
- Chemical abstracts service number (CAS number): 50-00-0.

Components and Contaminants of Formaldehyde in Formalin solutions

- 37.0% formaldehyde
- 63.0% water.
- Formic acid (alcohol free)
- Paraformaldehyde

Note:

Inhibited solutions contain 10-15% methanol.

Exposure limits

- Time-weighted average (TWA) - 0.75 ppm
- Short-term exposure limit (STEL) - 2 ppm



Substance Technical Guideline for Formaldehyde

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FORMALDEHYDE TECHNICAL DATA SHEET (Continued)

Physical properties

- Colorless liquid with a pungent odor
- Boiling point: 214°F (101°C)
- Specific gravity: 1.08 (H₂O = 1 @ 20 C)
- pH: 2.8-4.0
- Solubility:
- Miscible In water
- Solvent is soluble in alcohol and acetone
- Vapor density: 1.04 (Air = 1 @ 20 C)
- Odor threshold: 0.8-1 ppm.

Fire and explosion hazards

- Moderate fire and explosion hazard when exposed to heat or flame.
- Reaction with the following substances yields explosive compounds:
 - Nitrogen dioxide
 - Nitromethane
 - Perchloric acid and aniline
 - Peroxyformic acid
- Flash point: 185°F (85°C) closed cup.
Note:
Although the flash point of 37% formaldehyde solutions is above normal room temperature, the explosion range is very wide:
 - Lower explosion limit: 7% by volume in air
 - Upper explosion limit: 73% by volume in air
- Autoignition temperature: 806°F (430°C)
- Flammable class (WISHA): III A
 - Extinguishing media: Use the following:
 - Dry chemical
 - "Alcohol foam"
 - Carbon dioxide
 - Water in flooding amounts as fog
 - Solid streams may not be effective.
 - Flushing spills with water spray can dilute them to produce nonflammable mixtures. However, water runoff should be contained for treatment.
 - Cool fire-exposed containers with water from the side until well after fire is out.



Substance Technical Guideline for Formaldehyde

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FORMALDEHYDE TECHNICAL DATA SHEET (Continued)

➤ National Fire Protection Association Section 325M Designation:

- Health:
 - 2-Materials hazardous to health, but areas may be entered with full-faced mask self-contained breathing apparatus that provides eye protection.
- Flammability:
 - 2-Materials which should be moderately heated before ignition will occur. You may use water spray to extinguish the fire because the material can be cooled below its flash point.
- Reactivity:
 - D-Materials which:
 - In themselves are normally stable even under fire exposure conditions and
 - Are not reactive with water.

Normal fire fighting procedures may be used.

Reactivity

➤ Stability:

- Formaldehyde solutions may self-polymerize to form paraformaldehyde which precipitates.

➤ Incompatibility (materials to avoid):

- Strong oxidizing agents, caustics, strong alkalies, isocyanates, anhydrides, oxides, and inorganic acids. A violent reaction occurs when formaldehyde is mixed with strong oxidizers.
- Hydrochloric acid reacts to form the potent carcinogen, bis-chloromethyl ether.
- Nitrogen dioxide, nitromethane, perchloric acid and aniline, or peroxyformic acid reacts to yield explosive compounds.

➤ Hazardous combustion or decomposition products:

- Oxygen from the air can oxidize formaldehyde to formic acid, especially when heated.
- Formic acid is corrosive.

Health hazard data

➤ Acute animal toxicity

- Oral, rats: LD50 = 800 mg/kg
- Oral, mouse: LD50 = 42 mg/kg
- Inhalation, rats: LC50 = 250 mg/kg
- Inhalation, mouse: LC50 = 900 mg/kg
- Inhalation, rats: LC50 = 590 mg/kg



Substance Technical Guideline for Formaldehyde

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EXPOSURE MONITORING

- Initial monitoring is performed when there is a potential for an employee to be exposed to airborne formaldehyde in the workplace. If the initial monitoring indicates an exposure at or above the action level, the employer is required to continue monitoring periodically as indicated in Exposure evaluations, WAC 296-856-20050, of this chapter.
- Procedures for exposure monitoring are contained in Table HT-2, Monitoring Procedures.

Table HT-2
Monitoring Procedures

Task	Guidelines for Monitoring procedures
Selection of Employees to Monitor	<ul style="list-style-type: none">➤ If an employee's exposure to formaldehyde could exceed the 0.5 ppm action level or the 2 ppm STEL, exposure should be monitored.<ul style="list-style-type: none">– A "representative" employee or employees will be asked to wear a sampling device to collect formaldehyde samples.– Notify the person conducting the monitoring if you have any difficulties wearing the device.
Sampling and analysis methods	<ul style="list-style-type: none">➤ If methods to accurately evaluate the concentration of formaldehyde in employees' breathing zone include one of the following:<ul style="list-style-type: none">– Collection of formaldehyde on liquid or solid sorbents with subsequent chemical analysis.– Short-term exposure may be measured by real-time continuous monitoring systems and portable direct reading instruments.➤ Measurements taken to determine time-weighted average (TWA₈) exposures are best taken with samples covering the full shift.➤ Samples collected should be taken from the employee's breathing zone air.➤ If there are tasks that involve brief but intense exposure to formaldehyde, employee exposure should be measured to assure compliance with the STEL.
Notifying employees of monitoring results	<ul style="list-style-type: none">➤ Your employer should inform you of the results of exposure monitoring representative of your work.➤ Your employer may inform you in writing, but may also post the results where employees have ready access to them.
Corrective action	<ul style="list-style-type: none">➤ Corrective actions should be taken when monitoring results are above the 8-hour time weighted average (TWA₈) or the 15-minute short-term exposure limit (STEL)<ul style="list-style-type: none">– Document any reason why exposures can't be lowered to below the PEL



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EXPOSURE CONTROLS

Exposure controls means the use of equipment, processes, and work practices to eliminate or minimize exposure. The following control methods may be used as appropriate for your workplace.

Ventilation

- Ventilation is the most widely used control method for reducing the concentration of airborne formaldehyde. There are two primary types of ventilation:
 - Local exhaust ventilation, designed to capture airborne formaldehyde as near to the point of generation as possible. To protect you, the direction of contaminant (air) flow should always be toward the local exhaust system inlet and away from you.
 - and**
 - General dilution ventilation, involving continuous introduction of fresh air into the workroom to mix with the contaminated air and lower the concentration of formaldehyde.
 - Effectiveness depends on the concentration of formaldehyde and the volume of air supplied.
 - This may be the only practical method of control where devices emitting formaldehyde are spread out over a large area.



Link:

NIOSH has published a control bulletin discussing ventilation controls for formaldehyde exposures during embalming. For further information on this subject visit

<http://www.cdc.gov/niosh/hc26.html>

Substitution

- One of the most effective methods of controlling exposure to formaldehyde is to substitute a safer, less toxic material where possible



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EXPOSURE CONTROLS (CONTINUED)

Enclosure

- Enclosure of the process is another preferred method of controlling worker exposure. The employee is prevented from coming into direct contact with the formaldehyde. The enclosure should be designed with a slight vacuum so that any leaks will result in the flow of external air **into** the enclosure

Isolation

- Employees may be isolated from direct contact with the work environment by the use of automated equipment operated by personnel observing from a closed control booth or room

Work Practices

- Work practices and administrative procedures are an important part of a control system. If you are asked to perform a task in a certain manner to limit your exposure to formaldehyde, it's extremely important that you follow these procedures
- Formaldehyde is incompatible with and reacts with strong oxidizers, alkalis & acids; phenols; urea; oxides; isocyanates; caustics; anhydrides



Substance Technical Guideline for Formaldehyde

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PERSONAL PROTECTIVE EQUIPMENT (PPE)

This section addresses the selection and maintenance of protective equipment and clothing.

Skin protection

- Solutions containing greater than 1% formaldehyde are damaging to the skin and eyes. PPE adequate to prevent contact with such solutions needs to be provided to employees.
- Some solids that release formaldehyde and solutions that contain less than 1% formaldehyde can also pose a hazard to employees. In these instances, appropriate PPE needs to be provided in accordance with the general Personal Protective Equipment rule, WAC 296-800-160.
- Skin sensitization after exposure to high airborne concentrations has been reported. At concentration 100 ppm or more, the standard requires whole body protection.

Hand Protection

- Butyl and nitrile glove materials provide the greatest protection for the hands. Greater thicknesses of other materials (natural rubber, PVC, polyethylene) may be suitable for short use periods, but gloves may have to be changed more frequently due to degradation. All these materials are generally suitable for splash protection.
- Barrier creams aren't regarded as effective protection against formaldehyde

Respiratory protection

- Use NIOSH-approved full facepiece negative pressure respirators, with a change out schedule for the cartridges or canisters, or positive pressure supplied-air respirators as directed in chapter 296-842-130.
- In areas where the formaldehyde concentration might be 100 ppm or more, use complete body protection, including a positive pressure self-contained breathing apparatus (SCBA) with a full face piece or in combination with a supplied-air respirator.

Eye protection (For Formaldehyde solutions of 1% or more)

- If you might be splashed in the eyes with Formaldehyde, it's essential that you wear chemical resistant splash goggles or some other type of complete protection for the eye.
- You may also need a face shield in addition to eye protection to protect the face nose and mouth from splashes.



Substance Technical Guideline for Formaldehyde

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SPILLS AND OTHER EMERGENCIES

There isn't a specific exposure level that triggers the emergency response provisions for formaldehyde and its solutions. When determining if there is a need to provide for emergencies, consider the worst possible emergency scenario, and whether the employees' lives or health are in jeopardy.

- Don't attempt to clean up a spill unless you are properly trained and equipped to do so.
- Follow the procedure established by your employer for Formaldehyde spills.
- For small containers, place the leaking container into a larger container that can be sealed or into a well-ventilated area, such as a laboratory hood.
- Take up small spills with absorbent material and place the waste into properly labeled and sealed containers for later disposal.
- For larger spills, you may be able to neutralize the spill with sodium hydroxide or sodium sulfite.
- Be aware of your emergency response plan if you work in an area where a large amount of formaldehyde could be released in an accident or from equipment failure.
- You should be trained in your specific duties in the event of a release, and it's important that you clearly understand these duties.
- Emergency equipment should be accessible and you should be trained to use any equipment that you might need. Clean formaldehyde contaminated equipment before reuse.
- If a spill of appreciable quantity occurs leave the area quickly, unless you have specific emergency duties.
 - Don't attempt to remove a victim, unless that's your assigned duty.
 - Don't touch spilled material.
 - Use water spray to reduce vapors.
 - Don't smoke, and prohibit all flames or flares in the hazard area.



Note:

The Department of Ecology has rules regarding the clean up of toxic waste and notify state and local authorities, when required.



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EMERGENCY FIRST AID RESPONSE

- The information in Table HT-3 provides guidance for emergency first aid response in the event of acute exposure to formaldehyde.
 - Acute exposure to formaldehyde can result in severe or life threatening injury.
 - Any person experiencing an acute formaldehyde exposure should be evaluated by a physician
- If you are exposed to formaldehyde in an emergency situation and develop signs or symptoms associated with acute toxicity from formaldehyde exposure, your employer should provide you with a medical examination as soon as possible.
 - This medical examination should include all steps necessary to stabilize your health.
 - If symptoms are severe, you may be kept in the hospital for observation to ensure that any delayed effects are recognized and treated.



Substance Technical Guideline for Formaldehyde

Use with the Formaldehyde Rule, Chapter 296-856 WAC

EMERGENCY FIRST AID RESPONSE (CONTINUED)

Table HT-3
Guidelines for Emergency First Aid Response

Emergency situation	Guidelines for responding
Ingestion (swallowing):	<ul style="list-style-type: none"> ➤ If the victim is conscious, dilute, inactivate, or absorb the ingested formaldehyde by giving milk, activated charcoal, or water. Any organic material will inactivate formaldehyde. ➤ Keep affected person warm and at rest. ➤ Get medical attention immediately. ➤ If vomiting occurs, keep head lower than hips.
Inhalation (breathing):	<ul style="list-style-type: none"> ➤ Remove the victim from the exposure area to fresh air immediately. ➤ If breathing has stopped, give artificial respiration. ➤ Qualified first-aid or medical personnel should administer oxygen, if available, and maintain the patient's airways and blood pressure until the victim can be transported to a medical facility. ➤ If exposure results in a highly irritated upper respiratory tract and coughing continues for more than ten minutes, the worker should be hospitalized for observation and treatment. ➤ Keep the affected person warm and at rest.
Skin contact:	<ul style="list-style-type: none"> ➤ Remove contaminated clothing (including shoes) immediately. ➤ Wash the affected area of your body with soap or mild detergent and large amounts of water until no evidence of the chemical remains (at least 15 to 20 minutes). ➤ If there are chemical burns, get first aid to cover the area with sterile, dry dressing, and bandages. ➤ Get medical attention if you experience appreciable eye or respiratory irritation.
Eye contact:	<ul style="list-style-type: none"> ➤ Wash the eyes immediately with large amounts of water occasionally lifting lower and upper lids, until no evidence of chemical remains (at least 15 to 20 minutes). ➤ In case of burns, apply sterile bandages loosely without medication. ➤ Get medical attention immediately. If you have experienced appreciable eye irritation from a splash or excessive exposure, you should be referred promptly to an ophthalmologist for evaluation.



Notes

Medical Surveillance

Use with the Formaldehyde Rule, Chapter 296-856 WAC

This helpful tool provides additional information for medical providers who supply medical surveillance for formaldehyde exposure.

The occupational health hazards of formaldehyde exposure are primarily due to its toxic effects after the following experiences:

- Inhalation
- Direct contact with the skin or eyes by liquid or vapor
- Ingestion

Specifics about occupational health hazards and the effects of formaldehyde exposure are outlined on this form under the following topics:

- Effects of exposure
- Surveillance consideration
- Employer obligations
- Physicians obligations



Medical Surveillance

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EFFECTS OF EXPOSURE

Acute

- Inhalation:
 - Concentrations above 50 ppm can cause severe pulmonary reactions within minutes. These include pulmonary edema, pneumonia, and bronchial irritation.
 - Concentrations above 5 ppm readily cause irritation of the lower airway characterized by cough, chest tightness, and wheezing.
 - Formaldehyde gas can be a pulmonary sensitizer that can cause occupational asthma in a previously normal individual. Formaldehyde can produce symptoms of bronchial asthma in humans. The mechanism may be either sensitization of the individual by exposure to formaldehyde or direct irritation by formaldehyde in persons with preexisting asthma.
 - Formaldehyde is highly irritating to the upper airway, characterized by dry or sore throat, itching and burning sensations of the nose, and nasal congestion.
 - Upper airway irritation can occur over a wide range of concentrations, most frequently above 1 ppm. However, airway irritation has occurred in workers with exposures to formaldehyde as low as 0.1 ppm.
- Eye contact:
 - Concentrations of formaldehyde between 0.05 ppm and 0.5 ppm produce a sensation of irritation in the eyes with burning, itching, redness, and tearing.
 - Increased rate of blinking and eye closure generally protects the eye from damage at these low levels.
 - Tolerance can occur in workers continuously exposed to concentrations of formaldehyde in this range.
 - Accidental splash injuries of human eyes to aqueous solutions of formaldehyde (formalin) have resulted in a wide range of ocular injuries including corneal opacities and blindness. The severity of the reactions have been directly dependent on the concentration of formaldehyde in solution and the amount of time lapsed before emergency and medical intervention.



Medical Surveillance

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EFFECTS OF EXPOSURE (CONTINUED)

Acute (continued)

- Skin contact:
 - Exposure to formaldehyde solutions can cause irritation of the skin and allergic contact dermatitis.
 - Symptoms include erythema, edema, and vesiculation or hives.
 - Exposure to liquid formalin or formaldehyde vapor can provoke skin reactions in sensitized individuals even when airborne concentrations of formaldehyde are well below 1 ppm.
- Ingestion:
 - Ingestion of as little as 30 ml of a 37% solution of formaldehyde (formalin) can result in death.
 - Gastrointestinal toxicity after ingestion is most severe in the stomach and results in symptoms which can include nausea, vomiting, and severe abdominal pain.
 - Diverse damage to other organ systems including the liver, kidney, spleen, pancreas, brain, and central nervous systems can occur from the acute response to ingestion of formaldehyde.

Chronic

- Long-term exposure to formaldehyde has been shown to be associated with an increased risk of the following types of cancer in humans:
 - Cancer of the nose and accessory sinuses
 - Nasopharyngeal and oropharyngeal cancer
 - Lung cancer



Medical Surveillance

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SURVEILLANCE CONSIDERATIONS

Work History

- Because formaldehyde is a sensitizer, it is important to obtain work history on both prior occupational and non-occupational exposure to formaldehyde.

Medical History

- Respiratory
 - Include a comprehensive review of the respiratory system, for example, questions about:
 - Dyspnea on exertion
 - Shortness of breath
 - Chronic airway complaints
 - Hyperreactive airway disease
 - Rhinitis
 - Bronchitis
 - Bronchiolitis
 - Asthma
 - Emphysema
 - Respiratory allergic reaction
 - Other preexisting pulmonary disease
 - Obtain any prior history of symptoms from exposure to pulmonary irritants.
 - Obtain a complete smoking history.



Medical Surveillance

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SURVEILLANCE CONSIDERATIONS (CONTINUED)

Medical History (continued)

- Skin disorders
 - Previous exposure to formaldehyde and other dermal sensitizers.
 - A history of skin disorders including:
 - Skin irritation
 - Previously documented skin sensitivity
 - Other dermatologic disorders
- Atopic or allergic diseases
 - Identify individuals with prior allergen sensitization.
 - A history of atopic disease and allergies to formaldehyde or any other substances.



Note:

- Keep the findings of the medical and work histories in a standardized form for comparison of the year-to-year results.
- Comparison of the results from previous years with present results provides the best method for detecting a general deterioration in health, when toxic signs and symptoms are measured subjectively.



Medical Surveillance

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SURVEILLANCE CONSIDERATIONS (CONTINUED)

Physical Examination

- Mucosa of eyes and airways:
 - Be alert to evidence of this irritation.
 - A speculum examination of the nasal mucosa may be helpful in assessing possible irritation and cytotoxic changes, as may be indirect inspection of the posterior pharynx by mirror.
- Pulmonary system:
 - Perform a conventional respiratory examination, including inspection of the thorax and auscultation and percussion of the lung fields.
 - Pulmonary function testing should be used whenever the physician feels it's appropriate.
 - In cases of alleged formaldehyde-induced airway disease, other possible causes of pulmonary dysfunction (including exposures to other substances) should be ruled out.
 - A chest radiograph may be useful in these circumstances.
 - In cases of suspected airway hypersensitivity or allergy, it may be appropriate to use bronchial challenge testing with formaldehyde or methacholine to determine the nature of the disorder.
 - Such testing should be performed by, or under the supervision of, a physician experienced in the procedures involved.



Medical Surveillance

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SURVEILLANCE CONSIDERATIONS (CONTINUED)

Physical Examination (continued)

- Skin:
 - The physician should be alert to evidence of dermal irritation or sensitization, including:
 - Erythema and inflammation
 - Urticaria
 - Blistering
 - Scaling
 - Formation of skin fissures
 - Other symptoms.
 - Note the presence of other dermal diseases.
 - Skin sensitivity testing carries with it some risk of inducing sensitivity, and therefore, skin testing for formaldehyde sensitivity should not be used as a routine screening test.
 - Sensitivity testing may be indicated in the investigation of a suspected existing sensitivity.
 - Guidelines for such testing have been prepared by the North American Contact Dermatitis Group.
 - If necessary, other medical examinations or tests should be performed as indicated:
 - When workers are exposed in an emergency, focus the examination on the organ systems most likely to be affected.
 - If a severe overexposure requiring medical intervention or hospitalization has occurred, the physician must be alert to the possibility of delayed symptoms. Follow-up nonroutine examinations may be necessary to assure the patient's well-being.



Medical Surveillance

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EMPLOYER OBLIGATIONS

- Employers are required to provide the physician with all of the following:
 - A copy of Chapter 296-856 WAC, Formaldehyde
 - A description of the affected employee's duties as they relate to formaldehyde exposure
 - An estimate of the employee's exposure including duration, for example, 15 hours per week, or three 8-hour shifts, full-time
 - A description of any personal protective equipment, including respirators, used by the employee
 - The results of any previous medical determinations for the affected employee related to formaldehyde exposure, to the extent that this information is within the employer's control.



Medical Surveillance

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PHYSICIAN OBLIGATIONS

- Provide the employer with a written statement:
 - Containing an opinion regarding all of the following:
 - Whether the employee has any medical condition that increases their risk of impaired health from exposure to formaldehyde or the use of respirators
 - Any restrictions that should be placed on the employee's exposure to formaldehyde or use of respirators
 - The use of protective clothing or equipment such as respirators. If the employee wears a respirator as a result of his or her exposure to formaldehyde, the physician's opinion must also contain a statement regarding the suitability of the type of respirator assigned.
 - Containing no specific medical information or findings.
 - That indicates the employee has been told:
 - The results of the medical examination and
 - About any medical conditions that require further explanation or treatment



Notes

Medical Disease Questionnaire

Use with the Formaldehyd Rule, Chapter 296-856 WAC

IDENTIFICATION

- Business name:
- Date:
- Employee name:
- Identification code:
- Job title:
- Birth date:
- Age:
- Gender:
- Height:
- Weight:



Medical Disease Questionnaire

Use with the Formaldehyde Rule, Chapter 296-856 WAC

MEDICAL HISTORY

- Have you ever been admitted to the hospital as a patient?
Yes No
If yes, what kind of problem were you having?
- Have you ever had any kind of operation?
Yes No
If yes, what kind?
- Do you take any kind of medicine regularly?
Yes No
If yes, what kind?
- Are you allergic to any drugs, foods, or chemicals?
Yes No
If yes, what kind of allergy is it?
What causes the allergy?
- Have you ever been told that you have asthma, hay fever, or sinusitis?
Yes No
- Have you ever been told that you have emphysema, bronchitis, or any other respiratory problems?
Yes No
- Have you ever been told you had hepatitis?
Yes No
- Have you ever been told that you have cirrhosis?
Yes No
- Have you ever been told that you had cancer?
Yes No
- Have you ever had arthritis or joint pain?
Yes No
- Have you ever been told that you had high blood pressure?
Yes No
- Have you ever had a heart attack or heart trouble?
Yes No



Medical Disease Questionnaire

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MEDICAL HISTORY UPDATE

- Have you been admitted to the hospital as a patient any time within the past year?
Yes No
 - If so, for what condition?
- Have you been under the care of a physician during the past year?
Yes No
 - If so, for what condition?
- Is there any change in your breathing since last year?
Yes No
 - If a change, is it:
 - Better?
 - Worse?
 - Do you know why?
- Is your general health different this year from last year?
Yes No
 - If different, in what way?
- Have you in the past year, or are you now taking any medication on a regular basis?
Yes No
 - If yes:
 - Medication name
 - Condition being treated



Medical Disease Questionnaire

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OCCUPATIONAL HISTORY

- How long have you worked for your present employer?
- What jobs have you held with this employer? Include job title and length of time in each job.
- In each of these jobs, how many hours a day were you exposed to chemicals?
- What chemicals have you worked with most of the time?
- Have you ever noticed any type of skin rash you feel was related to your work?
Yes No
- Have you ever noticed that any kind of chemical makes you cough?
Yes No
 - Wheeze?
Yes No
 - Become short of breath or cause your chest to become tight?
Yes No
- Are you exposed to any dust or chemicals at home?
Yes No
 - If yes, explain.
- In other jobs, have you ever had exposure to:
 - Wood dust?
Yes No
 - Nickel or chromium?
Yes No
 - Silica (foundry, sand blasting)?
Yes No
 - Arsenic or asbestos?
Yes No
 - Organic solvents?
Yes No
 - Urethane foams?
Yes No



Medical Disease Questionnaire

Use with the Formaldehyd Rule, Chapter 296-856 WAC

OCCUPATIONAL HISTORY UPDATE

- Are you working on the same job this year as you were last year?
Yes No
 - If not, how has your job changed?
- What chemicals are you exposed to on your job?
- How many hours a day are you exposed to chemicals?
- Have you noticed any skin rash within the past year you feel was related to your work?
Yes No
 - If so, explain circumstances:
- Have you noticed that any chemical makes you cough, be short of breath, or wheeze?
Yes No
 - If so, can you identify it?



Medical Disease Questionnaire

Use with the Formaldehyde Rule, Chapter 296-856 WAC

MISCELLANEOUS

- Do you smoke?
Yes No
 - If so, how much and for how long?
 - Pipe
 - Cigars
 - Cigarettes
- Do you drink alcohol in any form?
Yes No
 - If so, how much, how long, and how often?
- Do you wear glasses or contact lenses?
Yes No
- Do you get any physical exercise other than that required to do your job?
Yes No
 - If so, explain:
- Do you have any hobbies or “side jobs” that require you to use chemicals, such as furniture stripping, sand blasting, insulation or manufacture of urethane foam, furniture, etc.?
Yes No
 - If so, please describe, giving type of business or hobby, chemicals used and length of exposures.



Medical Disease Questionnaire

Use with the Formaldehyde Rule, Chapter 296-856 WAC

SYMPTOMS QUESTIONNAIRE

- Do you ever have any shortness of breath?
Yes No
 - If yes, do you have to rest after climbing several flights of stairs?
Yes No
 - If yes, if you walk on the level with people your own age, do you walk slower than they do?
Yes No
 - If yes, if you walk slower than a normal pace, do you have to limit the distance that you walk?
Yes No
 - If yes, do you have to stop and rest while bathing or dressing?
Yes No
- Do you cough as much as three months out of the year?
Yes No
 - If yes, have you had this cough for more than two years?
Yes No
 - If yes, do you ever cough anything up from the chest?
Yes No
- Do you ever have a feeling of smothering, unable to take a deep breath, or tightness in your chest?
Yes No
 - If yes, do you notice that this occurs on any particular day of the week?
Yes No
 - If yes, what day of the week?
 - If yes, do you notice that this occurs at any particular place?
Yes No
 - If yes, do you notice that this is worse after you have returned to work after being off for several days?
Yes No



Medical Disease Questionnaire

Use with the Formaldehyde Rule, Chapter 296-856 WAC

SYMPTOMS QUESTIONNAIRE (CONTINUED)

- Have you ever noticed any wheezing in your chest?
Yes No
 - If yes, is this only with colds or other infections?
Yes No
 - Is this caused by exposure to any kind of dust or other material?
Yes No
 - If yes, what kind?
- Have you noticed any burning, tearing, or redness of your eyes when you are at work?
Yes No
 - If so, explain circumstances:
- Have you noticed any sore or burning throat or itchy or burning nose when you are at work?
Yes No
 - If so, explain circumstances:
- Have you noticed any stuffiness or dryness of your nose?
Yes No
- Do you ever have swelling of the eyelids or face?
Yes No
- Have you ever been jaundiced?
Yes No
 - If yes, was this accompanied by any pain?
Yes No
- Have you ever had a tendency to bruise easily or bleed excessively?
Yes No
- Do you have frequent headaches that are not relieved by aspirin or tylenol?
Yes No
 - If yes, do they occur at any particular time of the day or week?
Yes No
 - If yes, when do they occur?



Medical Disease Questionnaire

Use with the Formaldehyde Rule, Chapter 296-856 WAC

SYMPTOMS QUESTIONNAIRE (CONTINUED)

- Do you have frequent episodes of nervousness or irritability?
Yes No
- Do you tend to have trouble concentrating or remembering?
Yes No
- Do you ever feel dizzy, light-headed, excessively drowsy, or like you have been drugged?
Yes No
- Does your vision ever become blurred?
Yes No
- Do you have numbness or tingling of the hands or feet or other parts of your body?
Yes No
- Have you ever had chronic weakness or fatigue?
Yes No
- Have you every had any swelling of your feet or ankles to the point where you could not wear your shoes?
Yes No
- Are you bothered by heartburn or indigestion?
Yes No
- Do you ever have itching, dryness, or peeling and scaling of the hands?
Yes No
- Do you ever have a burning sensation in the hands, or reddening of the skin?
Yes No
- Do you ever have cracking or bleeding of the skin on your hands?
Yes No



Medical Disease Questionnaire

Use with the Formaldehyde Rule, Chapter 296-856 WAC

SYMPTOMS QUESTIONNAIRE (CONTINUED)

- Are you under a physician's care?
Yes No
– If yes, for what are you being treated?
- Do you have any physical complaints today?
Yes No
If yes, explain:
- Do you have other health conditions not covered by these questions?
Yes No
If yes, explain:



Medical Surveillance Fact Sheet For Employees

Use with Formaldehyde Rule, Chapter 296-856 WAC

You are strongly encouraged to participate in your employer's medical surveillance program. Participation in your employer's medical surveillance program will help to maintain a safe workplace and prevent illnesses associated with formaldehyde over-exposure. Components of a medical surveillance program include the following:

- Your employer should make sure a medical surveillance program is available to you under the following circumstances:
 - If your formaldehyde exposure is at concentrations above 0.5 ppm as an 8-hour average or 2 ppm over any 15-minute period
 - At no expense
 - At a reasonable time and place
 - At the time of initial assignment and once a year afterward as long as exposure is at least above the action level of 0.5 ppm, or the short term exposure limit (STEL) of 2 ppm
- If you have signs and symptoms that are related to formaldehyde exposure, inform your employer even if exposure is below the above concentrations.
- The surveillance plan should include:
 - A medical disease questionnaire
 - A physical examination if the physician determines this is necessary.
- If your exposure is above the PEL, you are required to wear a respirator, your employer should offer you a physical examination and a pulmonary function test every year.
- The physician should collect all information needed to determine whether you are at increased risk from exposure to formaldehyde.
- At the physician's discretion, the medical examination may include other tests to make this determination, such as a chest x-ray.
- After a medical examination, the physician should provide you with a written opinion which includes any special protective measures recommended and any restrictions on exposure.
- The physician should inform employees of any medical conditions they may have which would be aggravated by exposure to formaldehyde.
- Your employer is required to retain all records from medical examinations, including disease surveys. Additional information about employee medical records can be found in Chapter 296-802 WAC, Employee Exposure and Medical Records, a separate chapter.

